

LONDON- WEST MIDLANDS ENVIRONMENTAL STATEMENT

Volume 5 | Technical Appendices

CFA5 | Northolt Corridor

Data appendix (AQ-001-005)

Air quality

November 2013

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Department
for Transport

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1 Introduction

1.1.1 The air quality appendix for the Northolt Corridor community forum area (CFA5) comprises:

- discussion of the policy framework (Section 2);
- baseline air quality data (Section 3);
- dust impact evaluation and risk rating (Section 4); and
- air quality assessment - road traffic (Section 5).

1.1.2 Maps referred to throughout the air quality appendix are contained in the Volume 5, Air Quality Map Book.

2 Policy framework

- 2.1.1 The London Plan¹ forms the Regional Spatial Strategy for Greater London and integrates economic, environmental, transport and social frameworks. Specifically for air quality it seeks to achieve reductions in pollutant emissions and minimise public exposure to pollution. Policy 7.14 of the London Plan sets out a number of objectives such as minimising increased exposure to existing poor air quality, the need to reduce emissions from demolition and construction activities using best practice and the provision of on-site mitigation measures during development.
- 2.1.2 The Mayor's Air Quality Strategy² and Supplementary Planning Guidance (SPG) on Sustainable Design and Construction³ set out actions for improving London's air quality and include measures aimed at reducing emissions from transport and new developments. A key objective of the Strategy is to make better use of the planning process so that new developments do not contribute to air pollution. Policy 3 also gives support to the expansion of competitive rail-based alternatives to aviation including the development of a national high-speed rail network.
- 2.1.3 At the local level three of the local planning authorities in the Northolt Corridor area have policies that seek to limit pollution levels, improve air quality and reduce emissions from development:
- the London Borough of Brent's (LBB) Core Strategy⁴ Policy CP13 specifically refers to poor air quality in the North Circular Road Regeneration Area whilst Saved Policy EP4 of the Brent Unitary Development Plan (UDP)⁵ seeks to limit pollution especially where it affects air quality management areas (AQMA's);
 - the London Borough of Ealing (LBE) Core Strategy⁶ Policy 1.1 seeks to protect and improve air quality, Policy 3.1 commits to exploring opportunities for reducing exposure to air pollution in the A40 Corridor and Park Royal, and LBE UDP⁷ Saved Policy 2.6 seeks to reduce the level of air pollutants and achieve statutory limits;
 - the London Borough of Hillingdon (LBHi) Local Plan⁸ has several policies aimed at improving air quality including Strategic Policy SO10. Strategic Policies EM1 and EM8 identify the need to mitigate air quality impacts around the road network and Heathrow Airport, which makes a major contribution to poor air quality in Hillingdon.
- 2.1.4 In addition, local and regional guidance relevant to this assessment includes: LBE Draft SPG Air Quality and Pollution (2004)⁹; and local air quality action plans (AQAPs).

¹ Greater London Authority (GLA) (2011), *The London Plan: Spatial Development Strategy for Greater London*, GLA, London.

² Greater London Authority (GLA) (2010), *Clearing the Air: The Mayor's Air Quality Strategy*, GLA, London.

³ Greater London Authority (GLA) (2006), *Sustainable Design and Construction: The London Plan Supplementary Planning Guidance*, GLA, London.

⁴ London Borough of Brent (2010), *Core Strategy*.

⁵ London Borough of Brent (2011), *Unitary Development Plan*.

⁶ London Borough of Ealing (2012), *Core Strategy* (rough edit version)

⁷ London Borough of Ealing (2007), *Unitary Development Plan*.

⁸ London Borough of Hillingdon (2012), *Hillingdon Local Plan: Part 1 - Strategic Policies*,

⁹ London Borough of Ealing (2004), *Draft SPG 3 Air Quality and Pollution* – approved for development control purposes.

- 2.1.5 Local and regional guidance relevant to the consideration of climate change adaptation and air quality is provided in the draft Climate Change Adaption Strategy for London¹⁰.

¹⁰ Greater London Authority (GLA), (2010), *Draft Climate Change Adaptation Strategy for London*, GLA, London

3 Baseline air quality data

3.1 Existing air quality

Local authority review and assessment information

- 3.1.1 The London Borough of Harrow (LBHa) and LBE have designated air quality management areas (AQMA) covering their entire administrative areas. LBB and LBHi have designated AQMA covering much of the boroughs. Almost the entirety of the study area is within designated AQMA.
- 3.1.2 LBB¹¹, LBHa¹², LBHi¹³ and LBE¹⁴ all have air quality action plans in place aimed at improving air quality. Relevant policies and actions include:
- LBHa Policy 2.8 which encourages development which does not impact upon air quality;
 - LBHi Action 5.5 which aims to adopt the best practice strategy for all proposed development projects. This includes the use of low emission vehicles and equipment and the use of dust minimisation techniques. Action 6.5 aims to quantify the cumulative effects of new developments within the AQMA; and
 - LBE Proposal 50 which aims to ensure that fugitive dust emissions from construction sites are kept to a minimum.

Local air quality monitoring data

- 3.1.3 Monitoring sites within the study area that are considered relevant for this assessment are shown in Map AQ-01-005 (Volume 5, Air Quality Map Book). The following sections provide a summary of the recorded pollutant concentrations at these sites.
- 3.1.4 The pollutant concentrations can be compared to the air quality standards:
- 40µg/m³ as an annual mean for NO₂ and PM₁₀;
 - 200µg/m³ one-hour mean for NO₂ not to be exceeded more than 18 times a year (equivalent to the 99.8th percentile of the one-hour mean);
 - 50µg/m³ 24-hour mean for PM₁₀ not to be exceeded more than 35 times a year (equivalent to the 90.4th percentile of the 24-hour mean); and
 - 25µg/m³ as an annual mean for PM_{2.5}.

Continuous monitoring

- 3.1.5 This section summarises the results from the continuous monitoring sites that are considered relevant for the assessment of air quality in this study area.

¹¹ London Borough of Brent (2012), Air Quality Action Plan 2012-2015

¹² London Borough of Harrow (2004), Air Quality Action Plan.

¹³ London Borough of Hillingdon (2004), Air Quality Action Plan.

¹⁴ London Borough of Ealing (2003), Air Quality Action Plan.

Table 1: Annual mean pollutant concentrations recorded at continuous monitoring sites¹⁵

Pollutant	Annual mean concentrations (µg/m ³)				
	2008	2009	2010	2011	2012
LBB - Kingsbury (519600, 189300)¹⁶					
NO ₂	34	32	29	No data	No data
PM ₁₀	19	18	19	No data	No data
LBB - Ikea (520866, 185169)					
NO ₂	67	70	74	75	76
PM ₁₀	33	33	33	35	32
PM _{2.5}	16	15	14	16	13
LBE - Hanger Lane Gyrotory (518537, 182708)¹⁷					
NO ₂	106	93	90	79	95
PM ₁₀	No data	No data	No data	32	27
LBE - Southall (Blair Peach School) (511677, 180071)¹⁸					
NO ₂	31	31	31	29	35
PM ₁₀	19	20	20	22	20
PM _{2.5}	No data	No data	No data	No data	10
LBE - Acton Town Hall (520304, 180054)					
NO ₂	59	62	55	54	57
PM ₁₀	25	26	24	26	22
PM _{2.5}	12	11	11	13	No data ¹⁹
LBE - Acton Town Hall FDMS (520304, 180054)					
PM ₁₀	23	22	23	24	No data ²⁰
LBE - Ealing Town Hall (517541, 180738)					
NO ₂	39	40	44	42	38
LBE - Horn Lane (520432, 181428)					
NO ₂	No data ²¹	36	50	57	53
PM ₁₀	41	38	41	36	34
LBHa - Pinner Road (513504, 188998)					
NO ₂	49	46	53	47	47
PM ₁₀	25	24	24	25	25

¹⁵ Kings College London, www.londonair.org.uk, Accessed: May 2013¹⁶ Site closed in 2011¹⁷ PM₁₀ monitoring began in 2011¹⁸ PM_{2.5} monitoring began in 2012¹⁹ PM_{2.5} monitoring stopped in 2012²⁰ Site closed in 2011²¹ NO₂ monitoring began 2009

Pollutant	Annual mean concentrations ($\mu\text{g}/\text{m}^3$)				
	2008	2009	2010	2011	2012
LBHa - Stanmore (517877, 192314)					
NO ₂	26	28	26	25	25
PM ₁₀	17	17	17	20	18
PM _{2.5}	18	13	13	16	12
LBHi - Hillingdon Hayes (510283, 178905)					
NO ₂	50	56	54	55	46
PM ₁₀	22	22	24	25	25

Table 2: Number of hours when hourly mean NO₂ concentrations exceed $200\mu\text{g}/\text{m}^3$ at continuous monitoring sites^{22,23}

Site	Number of exceedances of hourly mean NO ₂ standard				
	2008	2009	2010	2011	2012
LBB - Kingsbury (519600, 189300)	0 (124)	0 (110)	0 (116)	No data	No data
LBB - Ikea (520866, 185169)	7 (187)	7 (188)	7 (185)	10 (193)	32 (220)
LBE - Hanger Lane Gyratory (518537, 182708)	91 (239)	163 (268)	134 (231)	66 (225)	173 (264)
LBE - Southall (Blair Peach School) (511677, 180071)	0 (116)	0 (102)	0 (93)	0 (102)	0 (106)
LBE - Acton Town Hall (520304, 180054)	26 (211)	13 (195)	4 (163)	2 (173)	3 (229)
LBE - Ealing Town Hall (517541, 180738)	0 (146)	0 (125)	1 (136)	0 (120)	0 (106)
LBE - Horn Lane (520432, 181428)	No data ²¹	0 (52)	0 (139)	14 (193)	2 (150)
LBHa - Pinner Road (513504, 188998)	2 (175)	4 (168)	4 (178)	0 (153)	3 (159)
LBHa - Stanmore (517877, 192314)	0 (105)	0 (101)	0 (97)	0 (96)	0 (102)
LBHi - Hillingdon Hayes (510283, 178905)	2 (163)	7 (177)	15 (192)	15 (199)	2 (151)

Table 3: Number of days when daily mean PM₁₀ concentrations exceed $50\mu\text{g}/\text{m}^3$ at continuous monitoring sites^{24,25}

Site	Number of exceedances of daily mean PM ₁₀ standard				
	2008	2009	2010	2011	2012
LBB - Kingsbury (519600, 189300)	5 (33)	4 (31)	2 (31)	No data	No data
LBB - Ikea (520866, 185169)	48 (54)	36 (52)	31 (52)	46 (61)	32 (50)
LBE - Hanger Lane Gyratory (518537, 182708)	No data	No data	No data	29 (51)	14 (43)

²² 99.8th percentile of hourly mean NO₂ concentrations in brackets ($\mu\text{g}/\text{m}^3$)²³ Kings College London, www.londonair.org.uk, Accessed: May 2013²⁴ 90.4th percentile of daily mean PM₁₀ concentrations in brackets ($\mu\text{g}/\text{m}^3$)²⁵ Kings College London, www.londonair.org.uk, Accessed: May 2013

Site	Number of exceedances of daily mean PM ₁₀ standard				
	2008	2009	2010	2011	2012
182708)					
LBE - Southall (Blair Peach School) (511677, 180071)	4 (32)	4 (32)	2 (31)	0 (13)	7 (34)
LBE - Acton Town Hall (520304, 180054)	19 (43)	13 (42)	7 (35)	24 (46)	1 (45)
LBE - Acton Town Hall FDMS (520304, 180054)	16 (41)	8 (37)	6 (36)	22 (47)	No data ²⁰
LBE - Horn Lane (520432, 181428)	91 (67)	N/A (62)	91 (70)	59 (57)	48 (54)
LBHa - Pinner Road (513504, 188998)	14 (41)	7 (38)	4 (35)	16 (41)	14 (42)
LBHa - Stanmore (517877, 192314)	4 (31)	1 (29)	1 (27)	9 (35)	5 (29)
LBHi - Hillingdon Hayes (510283, 178905)	2 (36)	6 (35)	7 (37)	18 (40)	15 (41)

Diffusion tubes

3.1.6 This section summarises the results from the diffusion tube sites that are considered relevant for the assessment of air quality in this study area.

Table 4: Annual mean NO₂ concentrations recorded at diffusion tube monitoring sites^{26, 27, 28, 29, 30, 31, 32}

Site	Ordnance Survey coordinates	Annual mean NO ₂ concentrations (µg/m ³)				
		2008	2009	2010	2011	2012
Fernlea House, Hanger Lane (triplicate)	518541, 182707	73	72	78	72	73
Wendover Court, Western Avenue - Top Floor	519997, 182178	47	56	69	70	55
Ealing Horn Lane AQMS (co-located triplicate)	520432, 181428	No data	No data ³³	60	59	52
Western Avenue AQMS (Co-located triplicate)	520430, 181950	No data	No data ³³	72	78	73
Wendover Court, Western Avenue - 2nd Floor	519997, 182178	43	58	68	72	55
326 Western Avenue	520424, 181957	No data ³⁴	51	63	76	59
Wendover Court, Western Avenue - 1st Floor	519997, 182178	44	58	69	70	55

²⁶ London Borough of Brent (2011), *Air Quality Progress Report*

²⁷ London Borough of Brent (2012), *Air Quality Updating and Screening Assessment*

²⁸ London Borough of Hillingdon (2011), *Air Quality Progress Report*

²⁹ London Borough of Hillingdon (2012), *Air Quality Updating and Screening Assessment*

³⁰ London Borough of Ealing (2009), *Fourth Round Updating and Screening Assessment*

³¹ London Borough of Ealing (2010), *Nitrogen dioxide Diffusion Tube Survey 2009*.

³² London Borough of Ealing (2011), *Nitrogen dioxide Diffusion Tube Survey: Annual Report 2010*

³³ Monitoring began in 2010

³⁴ Monitoring began in 2009

Site	Ordnance Survey coordinates	Annual mean NO ₂ concentrations (µg/m ³)				
		2008	2009	2010	2011	2012
Wendover Court, Western Avenue - Ground Floor	519997, 182178	43	59	67	67	55
17 Runnymede Gardens	515255, 183098	79	71	78	45	44
13 Blenheim Close	514866, 183116	42	38	48	49	42
Bengarth Road, Northolt, UB5	512108, 183540	46	45	48	43	41
Lilliput Avenue, UB5	512499, 183805	47	42	42	43	44
143 Church Road, Northolt, UB5	512690, 183983	61	61	66	68	No data ³⁵
Fernlea House, Hanger Lane	518540, 182700	112	79	83	94	No data ³⁵
St John Fisher Primary School, Thirlmere Avenue	517072, 182912	46	46	41	37	35
2 Horsenden Lane South, Greenford, UB6	516368, 182978	61	58	60	64	60
Oldfield primary School, Oldfield Lane North, Greenford (triplicate)	514753, 183342	41	48	42	38	38
Oldfield primary School, Oldfield Lane North, Greenford (triplicate)	514753, 183342	41	48	42	38	38
Oldfield primary School, Oldfield Lane North, Greenford (triplicate)	514753, 183342	41	48	42	38	38
5 Leamington Park	520532, 181517	35	45	48	50	46

Greater London Authority maps

- 3.1.7 Greater London Authority (GLA)³⁶ maps of modelled pollution levels provide further context on the spatial pattern of air pollution across London and indications of likely pollution levels across the capital. Modelling is less robust than monitoring data, however, and may not fully take into account local characteristics that influence pollution levels.
- 3.1.8 The GLA pollution maps estimate that annual NO₂ concentrations exceed air quality standards at or near main roads within the study area especially to the south of the route. They also show the Great Western Main Line (GWML) making a significant contribution to annual NO₂ concentrations along its route. The maps show no significant change in NO₂ levels from 2008 to 2011.
- 3.1.9 Annual mean PM₁₀ concentrations have reduced marginally at all locations between 2008 and 2011 according to the GLA modelling estimates, although not along main roads such as the A406 North Circular Road and Hanger Lane, which in 2011 were still in excess of the air quality standard. The number of days on which the PM₁₀

³⁵ Monitoring stopped in 2012

³⁶ Greater London Authority (GLA) (2010), *London Atmospheric Emissions Inventory 2008 Concentration Maps*; <http://data.london.gov.uk/laei-2008-concentration-maps>; Accessed: May 2013.

concentrations exceed the standard is estimated to have fallen between 2008 and 2011, although the frequency of exceedances is higher near busy roads.

- 3.1.10 Exceedances of the PM_{2.5} standards are predicted to be confined to locations along busy roads and are estimated to have decreased between 2008 and 2011. The GWML is thought to make a significant contribution to PM_{2.5} exceedances along its route through LBE, although future plans for electrification are expected to eliminate this source.

Background pollutant concentrations

- 3.1.11 Estimates of background air quality were obtained from the Department for Environment, Food and Rural Affairs (Defra) maps³⁷. Background NO₂ concentrations are close to or exceeding air quality standards throughout the study area. Background PM₁₀ levels are within air quality standards throughout the study area. NO₂ annual mean concentrations were in the range 17.7µg/m³ to 41.2µg/m³ in 2012. PM₁₀ annual mean concentrations were in the range 15.6µg/m³ to 22.9µg/m³ in 2012.
- 3.1.12 Defra background concentrations for the relevant assessment years were used in the Design Manual for Roads and Bridges (DMRB) assessment.

Local emission sources

- 3.1.13 The main sources of pollution within the study area are road vehicles and industrial sources. Major roads include the A406 North Circular Road, the Hanger Lane Gyratory and Horn Lane. Other emission sources include permitted Part A^{38, 39} processes, comprising an organic chemical facility, waste recovery centre and a metal works⁴⁰, some of which will be removed as part of the Proposed Scheme. It is unlikely that these will have an effect on local air quality in combination with the Proposed Scheme. Contributions to local pollutant concentrations made by these industrial installations are included within background concentrations used in this assessment.

3.2 Receptors

Human

Construction phase

- 3.2.1 There are many potential receptors in the Northolt Corridor area that are close to construction sites and roads where traffic flows could change. These include residential properties, commercial premises and community facilities. Receptors at greatest risk of dust effects are indicated in Map AQ-02-05-01 (Volume 5, Air Quality Map Book).

Operational phase

- 3.2.2 There are many human receptors in the Northolt Corridor area and high densities of residential properties.

³⁷ Department for Environment, Food and Rural Affairs (Defra) (2010) *Defra background maps 2010*; <http://laqm.defra.gov.uk/maps/maps2010.html>; Accessed: July 2013.

³⁸ *Pollution Prevention and Control Act 1999* (c.24). London, Her Majesty's Stationery Office.

³⁹ *The Environmental Permitting (England and Wales) Regulations 2010* (SI 210 No. 675). London, Her Majesty's Stationery Office.

⁴⁰ Environment Agency, *What's in your Backyard?*; <http://www.environment-agency.gov.uk/wiyby>; Accessed: August 2013.

Ecological

Construction phase

- 3.2.3 There are no ecological receptors with statutory designations within the Northolt Corridor area that are considered likely to be affected by air quality as a result of the construction of the Proposed Scheme.

Operational phase

- 3.2.4 No ecological receptors in the Northolt Corridor area are considered likely to be affected by air quality as a result of the operational phase.

4 Dust impact evaluation and risk rating

4.1.1 The following sections provide details of the assessment of construction impacts following the Institute of Air Quality Management (IAQM) guidance⁴¹. Where considered useful to identify receptors and their relationship to the construction activity, a specific figure is provided.

Table 5: Evaluation and risk rating of construction activities

Activity	Distance to nearest receptor	Dust emission class	Dust risk category	Sensitivity of surrounding area	Magnitude of impact (with draft Code of Construction Practice mitigation measures ⁴²)	Principal justifications 1. Dust emission class 2. Sensitivity of surrounding area
Westgate vent shaft						
Demolition	100-200m	Medium	Low	Low	Negligible	1. Between 20,000m ³ -50,000m ³ waste generated during demolition 2. No receptors within 20m
Earthworks	50-100m	Medium	Medium	Low	Negligible	1. Total site area 2,500m ² - 10,000m ² 2. No receptors within 20m
Construction	50-100m	Medium	Medium	Low	Negligible	1. Use of dusty construction materials (e.g. concrete) Diaphragm walling on site 2. No receptors within 20m

⁴¹ Institute of Air Quality Management (IAQM), (2011), *Guidance on the assessment of the impacts of construction on air quality and the determination of their significance*

⁴² Volume 5: Appendix CT-003-000

Activity	Distance to nearest receptor	Dust emission class	Dust risk category	Sensitivity of surrounding area	Magnitude of impact (with draft Code of Construction Practice mitigation measures ⁴²)	Principal justifications 1. Dust emission class 2. Sensitivity of surrounding area
Trackout	50-100m	Large	Low	Low	Negligible	1. More than 100 heavy goods vehicle (HGV) trips per day 2. No receptors within 20m
Greenpark Way vent shaft						
Demolition	N/A	N/A	N/A	N/A	N/A	No demolition on site
Earthworks	50-100m	Large	Medium	Low	Negligible	1. Total site area more than 10,000m ² 2. No receptors within 20m
Construction	50-100m	Medium	Medium	Low	Negligible	1. Use of dusty construction materials (e.g. concrete) Diaphragm walling on site 2. No receptors within 20m
Trackout	50-100m	Large	Low	Low	Negligible	1. More than 100 HGV trips per day 2. No receptors within 20m
Mandeville Road vent shaft (Map AQ-02-005-01, Figure 5.1 (Volume 5, Air Quality Map Book))						
Demolition	20-100m	Medium	Medium	Medium	Negligible	1. Potentially dusty material generated during demolition 2. Fewer than 10 receptors within 20m

Activity	Distance to nearest receptor	Dust emission class	Dust risk category	Sensitivity of surrounding area	Magnitude of impact (with draft Code of Construction Practice mitigation measures ⁴²)	Principal justifications 1. Dust emission class 2. Sensitivity of surrounding area
Earthworks	Less than 20m	Large	High	Medium	Negligible	1. Total site area more than 10,000m ² 2. Fewer than 10 receptors within 20m
Construction	20-50m	Medium	Medium	Medium	Negligible	1. Use of dusty construction materials (e.g. concrete) Diaphragm walling on site 2. Fewer than 10 receptors within 20m
Trackout	Less than 20m	Large	High	Medium	Negligible	1. More than 100 HGV trips per day 2. Fewer than 10 receptors within 20m

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Table 6: Summary of construction dust impacts and effects

Location	Magnitude of impact	Effect of dust-generating activities	Additional mitigation
Westgate vent shaft	Negligible	Not significant	None required
Greenpark Way vent shaft	Negligible	Not significant	None required
Mandeville Road vent shaft	Negligible	Not significant	None required

5 Air quality assessment - road traffic

5.1 Overall assessment approach

- 5.1.1 The air quality assessment for road related emissions has used three different approaches based on the scale of changes in traffic and road alignment. Where the DMRB⁴³ thresholds detailed in the Scope and Methodology Report (SMR) (Volume 5: Appendix CT-001-000/1) will not be exceeded, any additional assessment is not required as the air quality impacts will be minimal. If these thresholds are breached, then a quantitative assessment has been carried out.
- 5.1.2 If it is considered unlikely that air quality standards will be exceeded and the road configuration is a simple one, then the DMRB screening method has been used to predict changes in air quality. Where there will be a risk of standards being exceeded, where the road layout is considered to be complex or where the use of the DMRB screening method has indicated that there will be a potential exceedance of air quality standards, then the atmospheric dispersion model ADMS-Roads has been used for the assessment. Professional judgment has been used to select the appropriate tool for each area.
- 5.1.3 In this study area the DMRB screening method has been used for the assessment.

5.2 Construction traffic model

- 5.2.1 Roads assessed for construction traffic are detailed in Volume 5: Appendix TR-001-000. Scenarios assessed correspond to two peak phases of construction:
- test 1, representing construction traffic movements in January 2018 of the construction programme; and
 - test 2, representing construction traffic movements in April to June 2024 of the construction programme.

Receptors assessed

- 5.2.2 For all road links where DMRB criteria for local air quality were met, a number of receptors representative of worst-case exposure locations were selected for assessment. These included locations representative of highest concentrations along the roads, including those closest to junctions or to the road itself. Receptors assessed using the DMRB screening methodology are listed in Table 7 and shown in Map AQ-01-005 (Volume 5, Air Quality Map Book).

⁴³ Highways Agency, (2007), *The Design Manual for Roads and Bridges (Volume 11, Section 3, Part 1 Air Quality HA207/07)*

Table 7: Modelled receptors (construction phase)

Receptor	Description/location	Ordnance Survey coordinates	Scenarios assessed
5-1	Property at Welland Gardens	515889, 183014	Test 1
5-2	Property at junction of Burns Way and Henlys Roundabout	511528, 176445	Test 1, test 2
5-3	Hanger Lane Underground Station, north-west of Hanger Lane Gyratory	518502, 182609	Test 2
5-4	Property at junction of Alperton Lane and Western Avenue	517253, 182852	Test 1, test 2
5-5	Property on Kensington Road	513148, 183571	Test 1, test 2
5-6	Shree Kutch Leva Patel Community Centre, West End Road	511233, 184369	Test 1
5-7	Property at junction of Western Avenue and Oldfield South Lane	514625, 183211	Test 1
5-8	Property at junction of Church Road and Target Roundabout	512524, 183922	Test 1, test 2
5-9	Property at Eskdale Avenue	512745, 183914	Test 1, test 2
5-10	Property at junction of Blenheim Close and Western Avenue	514853, 183160	Test 1, test 2
5-11	Property at Meadow Close	513068, 202731	Test 1, test 2
5-12	Property at Bideford Avenue and Teignmouth Gardens	516561, 182960	Test 1, test 2
5-13	Property at Berry Grove Lane (near M1)	513162, 197933	Test 1, test 2
5-14	Property at junction of Lynwood Road and Western Avenue	517967, 182686	Test 1
5-15	Property at Percheron Road (near Barnet Lane)	520517, 195401	Test 2
5-16	Lakeside Drive, near First Central Business Park	519050, 182569	Test 1
5-17	Property at Wyresdale Crescent	515882, 182910	Test 1, test 2
5-18	Property at junction of Western Avenue and Park Royal Road	520557, 181787	Test 1

Background concentrations

5.2.3 The background concentrations used in the assessment are shown in Table 8 and Table 9 taken from the Defra maps³⁷.

Table 8: Background 2012 concentrations at assessed receptors

Receptor (or zone of receptors)	Concentrations (µg/m ³)		
	NO _x	NO ₂	PM ₁₀
(5-1) Property at Welland Gardens	52.1	30.1	19.6

Receptor (or zone of receptors)	Concentrations ($\mu\text{g}/\text{m}^3$)		
	NO _x	NO ₂	PM ₁₀
(5-2) Property at junction of Burns Way and Henlys Roundabout	57.3	32.7	19.6
(5-3) Hanger Lane Underground Station, north-west of Hanger Lane Gyratory	69.2	37.1	22.1
(5-4) Property at junction of Alperton Lane and Western Avenue	61.3	33.9	20.9
(5-5) Property on Kensington Road	59.4	33.2	21.3
(5-6) Shree Kutch Leva Patel Community Centre, West End Road	45.5	27.3	19.1
(5-7) Property at junction of Western Avenue and Oldfield South Lane	59.2	33.3	21.0
(5-8) Property at junction of Church Road and Target Roundabout	50.0	29.4	20.0
(5-9) Property at Eskdale Avenue	50.0	29.4	20.0
(5-10) Property at junction of Blenheim Close and Western Avenue	59.2	33.3	21.0
(5-11) Property at Meadow Close	42.7	25.4	18.7
(5-12) Property at Bideford Avenue and Teignmouth Gardens	58.6	32.9	20.4
(5-13) Property at Berry Grove Lane (near M1)	41.1	24.9	18.2
(5-14) Property at junction of Lynwood Road and Western Avenue	61.3	33.9	20.9
(5-15) Property at Percheron Road (near Barnet Lane)	36.5	22.5	17.5
(5-16) Lakeside Drive, near First Central Business Park	78.5	39.7	22.3
(5-17) Property at Wyresdale Crescent	51.9	30.0	19.0
(5-18) Property at junction of Western Avenue and Park Royal Road	74.6	38.6	22.3

Table 9: Background 2017 concentrations at assessed receptors

Receptor (or zone of receptors)	Concentrations ($\mu\text{g}/\text{m}^3$)		
	NO _x	NO ₂	PM ₁₀
(5-1) Property at Welland Gardens	40.9	25.0	18.4
(5-2) Property at junction of Burns Way and Henlys Roundabout	46.3	27.8	18.3
(5-3) Hanger Lane Underground Station, north-west of Hanger Lane Gyratory	54.1	30.9	20.7

Receptor (or zone of receptors)	Concentrations ($\mu\text{g}/\text{m}^3$)		
	NO _x	NO ₂	PM ₁₀
(5-4) Property at junction of Alpertown Lane and Western Avenue	48.1	28.3	19.6
(5-5) Property on Kensington Road	45.3	27.0	19.9
(5-6) Shree Kutch Leva Patel Community Centre, West End Road	35.1	22.1	18.0
(5-7) Property at junction of Western Avenue and Oldfield South Lane	45.3	27.1	19.7
(5-8) Property at junction of Church Road and Target Roundabout	38.6	23.9	18.8
(5-9) Property at Eskdale Avenue	38.6	23.9	18.8
(5-10) Property at junction of Blenheim Close and Western Avenue	45.3	27.1	19.7
(5-11) Property at Meadow Close	29.5	18.9	17.6
(5-12) Property at Bideford Avenue and Teignmouth Gardens	45.9	27.3	19.2
(5-13) Property at Berry Grove Lane (near M1)	31.7	20.3	17.1
(5-14) Property at junction of Lynwood Road and Western Avenue	48.1	28.3	19.6
(5-15) Property at Percheron Road (near Barnet Lane)	28.7	18.5	16.5
(5-16) Lakeside Drive, near First Central Business Park	62.3	33.7	20.8
(5-17) Property at Wyresdale Crescent	41.0	25.0	17.9
(5-18) Property at junction of Western Avenue and Park Royal Road	61.2	33.4	20.9

DMRB model results

5.2.4 This section provides the summary of the modelled pollutant concentrations for the assessed receptors. The magnitude of change and impact descriptor are also derived following the Environmental Protection UK (EPUK) methodology⁴⁴.

Table 10: Summary of DMRB annual mean NO₂ results (construction phase)

Receptor	Concentrations (µg/m ³)			Change in concentrations (µg/m ³)	Magnitude of change	Impact descriptor
	2012 baseline	2017 without Proposed Scheme	2017 with Proposed Scheme ⁴⁵			
5-1	41.7	33.1	33.2	0.2	Imperceptible	Negligible
5-2	34.8	27.0	27.1	0.1	Imperceptible	Negligible
5-3	28.8	24.3	24.4	0.1	Imperceptible	Negligible
5-4	49.2	40.1	40.3	0.2	Imperceptible	Negligible
5-5	33.0	28.1	28.1	0.0	Imperceptible	Negligible
5-6	59.6	49.3	49.8	0.5	Small	Slight adverse
5-7	74.0	61.0	61.4	0.4	Small	Slight adverse
5-8	51.4	41.7	42.0	0.3	Imperceptible	Negligible
5-9	29.4	23.6	23.7	0.1	Imperceptible	Negligible
5-10	44.2	35.4	35.6	0.1	Imperceptible	Negligible
5-11	64.6	52.3	53.1	0.8	Small	Slight adverse
5-12	42.7	34.4	34.7	0.3	Imperceptible	Negligible
5-13	46.1	37.2	37.4	0.2	Imperceptible	Negligible
5-14	57.0	46.3	46.6	0.3	Imperceptible	Negligible

⁴⁴ Environmental Protection UK (EPUK), (2010), *Development Control: Planning for Air Quality*

⁴⁵ Where more than one scenario has been assessed, concentrations presented represent the highest of the test scenarios

Receptor	Concentrations ($\mu\text{g}/\text{m}^3$)			Change in concentrations ($\mu\text{g}/\text{m}^3$)	Magnitude of change	Impact descriptor
	2012 baseline	2017 without Proposed Scheme	2017 with Proposed Scheme ⁴⁵			
5-15	28.5	22.9	24.5	1.6	Small	Negligible
5-16	38.0	32.4	32.4	0.0	Imperceptible	Negligible
5-17	34.1	28.1	28.6	0.4	Small	Negligible
5-18	67.1	56.8	57.7	0.9	Small	Slight adverse

Table 11: Summary of DMRB annual mean PM₁₀ results (construction phase)

Receptor	Concentrations ($\mu\text{g}/\text{m}^3$)			Change in concentrations ($\mu\text{g}/\text{m}^3$)	Magnitude of change	Impact descriptor
	2012 baseline	2017 without Proposed Scheme	2017 with Proposed Scheme			
5-1	22.3	22.0	22.0	0.0	Imperceptible	Negligible
5-2	20.8	20.5	20.6	0.0	Imperceptible	Negligible
5-3	18.4	18.3	18.3	0.0	Imperceptible	Negligible
5-4	23.8	22.7	22.7	0.0	Imperceptible	Negligible
5-5	18.6	18.6	18.6	0.0	Imperceptible	Negligible
5-6	26.3	25.2	25.3	0.0	Imperceptible	Negligible
5-7	29.4	28.4	28.5	0.0	Imperceptible	Negligible
5-8	24.4	23.9	24.0	0.0	Imperceptible	Negligible
5-9	19.3	19.2	19.2	0.0	Imperceptible	Negligible
5-10	23.2	22.7	22.7	0.0	Imperceptible	Negligible
5-11	25.2	23.9	24.0	0.1	Imperceptible	Negligible

Receptor	Concentrations ($\mu\text{g}/\text{m}^3$)			Change in concentrations ($\mu\text{g}/\text{m}^3$)	Magnitude of change	Impact descriptor
	2012 baseline	2017 without Proposed Scheme	2017 with Proposed Scheme			
5-12	23.5	23.0	23.1	0.0	Imperceptible	Negligible
5-13	22.9	22.4	22.4	0.0	Imperceptible	Negligible
5-14	25.5	24.8	24.8	0.0	Imperceptible	Negligible
5-15	17.8	17.7	17.8	0.1	Imperceptible	Negligible
5-16	20.9	20.8	20.8	0.0	Imperceptible	Negligible
5-17	19.0	18.8	18.8	0.0	Imperceptible	Negligible
5-18	26.9	26.2	26.3	0.1	Imperceptible	Negligible

Assessment of significance

- 5.2.5 The significance of the impacts on air quality from construction traffic associated with HS2 has been assessed in line with the EPUK methodology⁴⁴. AQMAs cover the study area and baseline pollution levels exceed the air quality standard for NO₂ in many locations, particularly along major roads.
- 5.2.6 The DMRB assessment predicted that air quality impacts in the study area will be slight adverse at worst for NO₂ and negligible for PM₁₀. The effect will not be significant.

5.3 Operational traffic model

Receptors assessed

- 5.3.1 No traffic links meeting the DMRB criteria were identified within the study area for the operational assessment. As such, no receptors were assessed and changes in air quality are considered negligible.

Assessment of significance

- 5.3.2 There will be no significant effects arising from the negligible changes to air quality caused by traffic during operation.

6 References

- Department for Environment, Food and Rural Affairs (Defra) (2010), *Defra background maps 2010*; <http://laqm.defra.gov.uk/maps/maps2010.html>; Accessed: July 2013.
- Department for Environment, Food and Rural Affairs (2007), *The Air Quality Strategy for England, Scotland, Wales and Northern Ireland*. London, Her Majesty's Stationery Office
- Environment Agency, *What's in your Backyard?*; <http://www.environment-agency.gov.uk/wiyby>; Accessed: August 2013.
- Greater London Authority (GLA) (2011), *The London Plan: Spatial Development Strategy for Greater London*, GLA, London.
- Greater London Authority (GLA) (2010), *Clearing the Air: The Mayor's Air Quality Strategy*, GLA, London.
- Greater London Authority (GLA), (2010), *Draft Climate Change Adaptation Strategy for London*, GLA, London
- Greater London Authority (GLA) (2010), *London Atmospheric Emissions Inventory 2008 Concentration Maps*; <http://data.london.gov.uk/laei-2008-concentration-maps>; Accessed: May 2013.
- Greater London Authority (GLA) (2006), *Sustainable Design and Construction: The London Plan Supplementary Planning Guidance*, GLA, London.
- Highways Agency (2007), *The Design Manual for Roads and Bridges (Volume 11, Section 3, Part 1 Air Quality, HA207/07)*
- Institute of Air Quality Management (IAQM) (2011), *Guidance on the assessment of the impacts of construction on air quality and the determination of their significance*.
- Kings College London, www.londonair.org.uk, Accessed: May 2013
- London Borough of Brent (2012) *Air Quality Action Plan 2012-2015*
- London Borough of Brent (2010), *Core Strategy*.
- London Borough of Brent (2011), *Unitary Development Plan*.
- London Borough of Ealing (2012), *Core Strategy*
- London Borough of Ealing (2007), *Unitary Development Plan*.
- London Borough of Brent (2012), *Air Quality Updating and Screening Assessment*
- London Borough of Brent (2011), *Air Quality Progress Report*
- London Borough of Ealing (2003), *Air Quality Action Plan*.
- London Borough of Ealing (2004), *Draft SPG 3 Air Quality and Pollution – approved for development control purposes*.
- London Borough of Ealing (2009), *Fourth Round Updating and Screening Assessment*

London Borough of Ealing (2011), *Nitrogen dioxide Diffusion Tube Survey: Annual Report 2010*

London Borough of Ealing (2010), *Nitrogen dioxide Diffusion Tube Survey 2009*.

London Borough of Harrow (2004), *Air Quality Action Plan*.

London Borough of Hillingdon (2004), *Air Quality Action Plan*.

London Borough of Hillingdon (2012), *Air Quality Updating and Screening Assessment*

London Borough of Hillingdon (2012), *Hillingdon Local Plan: Part 1 - Strategic Policies*.

London Borough of Hillingdon (2011), *Air Quality Progress Report*.

Pollution Prevention and Control Act 1999 (c.24). London, Her Majesty's Stationery Office.

The Environmental Permitting (England and Wales) Regulations 2010 (SI 210 No. 675). London, Her Majesty's Stationery Office.